may be positioned together on the tape to receive note characters. Each note character portion consists of a bracket pulse section (BP) **97** followed by an identification (ID) bit section **98** and a braille bit pattern section **99**. The bracket pulse section **97** alerts the machine to the fact that a new character is being received. The bracker pulse is present in each of the book character sections and index sections also. The identification portion **98** tells the machine what kind of character, that is, note, book or index, follows. The braille bit pattern **99** tells the machine what particular braille character should be imprinted on the belt. This braille bit pattern only occurs with note or book characters and not with an index character.

Book character sections have an arbitrary number of book characters **101, 102, 103** similar to the note character sections. Each book character consists of a bracket pulse section **105**, an identification section **106** and a braille bit pattern **107** similar to the sections of the note characters.

Each index character consists of an index bit pattern **109** followed by a bracket pulse **110** followed by an identification bit pattern **111** and a second index bit pattern **112**. The extra index bit pattern **109** preceding the bracket pulse permits a greater number of indexing points that would be possible if only a single index bit pattern were used, yet the machine logic used for the note characters or book characters can be used to process the index bit pattern. Operation of the machine in distinguishing between the various characters will be described in a subsequent portion of the specification. While a particular location of the different character portions has been shown in FIG. **5**, ii should be noted that any desired intermixture of the book, note and index character portions of the tape may be used as the machine proceeds to the next desired character portion and ignores any in-between characters which are not desired. Book and note character portions are similar in the manner in which they control the machine when the machine is in a reading mode. However, the book character ID bit pattern acts to prevent the machine from stopping at a book character portion when the machine is in a writing mode to prevent destruction of a prerecorded tape.

As show in FIG. **5**, a large amount of the control and timing information for the operation of the machine is carried on the tape. This simplifies the control system of the machine, permitting a reduction in its costs and size without a reduction in its capabilities.

Referring to FIG. **6**, there is shown the bit pattern which is placed on the tape. Two tape tracks, track A and track B, are used. If a binary 1 is stored on the tape, track A has a 1 and track B has a 0. If a binary 0 is stored on the tape, track A has a 0 and track B has a 1. A 1 is stored on both track A and track B represents a bracket pulse. Blank spaces on the tapes have no pulses. By this means the magnetic tape always has at least one pulse in each recorded position so that it can provide its own clocking pulses for machine operation. Where note character portions are provided on a prerecorded tape, the note character portions have a 0 recorded on the tape so that clock pulses are available.

Referring to FIG. **7**, there is shown a block diagram of the data flow and control system logic used with this machine. The motor drive system **115** drives the tape reels **116** and **117** in the manner previously described. Point **118** represents the capstan drive for the magnetic tape **114**. Motor drive system **115** also operates belt **120** through drive wheel **121** in the manner previously described. In this drawing, the initials CL represent a connection to control logic **123**. These connections have been omitted to provide a clearer drawing.

Assuming that the machine is in the mode of operation to read a prepared tape (read book mode), the operator, by actuating the belt switch **124**, sets the machine in operation. Tape **114** is moved past the tape head **126** and the information stored on the tape is read and coupled to tape head switch **127**. Since the machine is reading, the information is sent to the read amplifier **128** and amplified thereby. Since at least one pulse is present in each recorded tape position, these pulses are used as a clock signal by data clock **130**. The clock signal is coupled to control logic **123** through clock select switch **131**. An oscillator **132** provides a clock signal when the machine is in a writing mode and there is no clock signal from the tape **114**.

The output of read amplifier **128** is coupled to register **135** and bracket pulse detector **136**. Bracket pulse detector **136** detects each bracket pulse and conveys this information to control logic **123** for proper logic control. As data are read from tape **114**, they are stepped through register **135** into registers **138** and **139**. The timing of the logic and the capacity of registers **138** and **139** is such that the identification bits for the book character **106** of FIG. **5** will be in register **139** and the braille bit pattern **107** of FIG. **5** will be in register **138**. At this time in the operation of the machine, character type detector **141** determines that the bit pattern in register **138** is a book character and the information in register **138** is transferred through gate **143** to gate **145**. Gate **145** is set to select either register **147** or **148**. Each of registers **147** and **148** can hold a number of braille bit patterns and gate **145** is set to a desired register and remains connected to that register until the register is filled. With gate **145** connected to register **147**, gate **150** is connected to register **148** to receive the information in register **148**. Gates **145** and **150** are always connected to different registers and this operation is controlled by the character register control **151**. This logic permits the magnetic tape and the reading belt to operate without requiring synchronization between them as long as the tape is read at a slightly faster rate, when it is in motion, than the belt is imprinted. When the information from the tape fills register **147** and there is information in register **148**, the reading of the tape is stopped until register **148** has been cleared by reading out the information therein.

As the information is read out of register **148**, the signals are amplified in driver circuit **153** and applied to solenoids **154**. Solenoids **154** form the raised characters on belt **120** in the manner previously described according to the braille bit patterns which have been read from tape **114**. A magnetic pickup head **156** reads the timing marks on belt **120** to permit operation of the solenoids **154** only when belt **120** is in the proper position for imprinting.

When the operator of the machine desires to read notes which have been placed on tape **114**, logic control **123** is placed in he read note mode. The operation of the machine in the read book mode is substantially identical to its operation in the read book mode. In the read book mode, when the identification bits in register **139** indicate that a note character is in register **138**, the contents of the register are transferred through gates **143** and **145** to the desired one of registers **147** and **148**. In the read note mode book and index characters are ignored.

When it is desired to find a particular index mark, logic control **123** is placed in the index position and index switches **158** are set to the proper position. The output from tape **114** is coupled to registers **135, 138, 139** and register **159**. Referring to FIG. **5**, it will be noted that the index character pattern includes an additional index bit pattern **109** which precedes the bracket pulse. Thus when register **139** contains the ID bits **111**, register **138** contains the index bit patterns **112** and register **159** contains the index bit patterns **109**. This provides a substantial increase in the number of index positions which are available. For example, if a six bit index pattern **112** only were used, **63** index positions would be available. By providing the additional index bit pattern **109**, the number of index positions available is increased to **4095**. By using the coding arrangement shown, the note character and book character portions of the machine can be used to process index bit patterns with only the requirement of an additional register **159**. The outputs of registers **138** and **139** are coupled to the index-comparing circuit **161**. When the numbers in registers **138** and **159** coincide with the number set on index switches **158**, tape **114** is stopped and the index position desired has been reached.